

WHAT IS CLAIMED IS:

1. A computer-implemented method for creating and distributing classified listings, the method comprising, at a programmed user computer system:
  - a) providing a user interface providing facilities for creating, maintaining, and deleting listings from a local listings database;
  - b) downloading by way of the network a classification data structure defining a plurality of classifications;
  - c) accepting from a user listing information defining a new listing, the listing information including one or more classifications from the classification data structure to associate with the listing;
  - d) storing the listing in the local listings database; and,
  - e) forwarding at least some listing information about listings in the local listings database to at least one search server on the network.
2. The method of claim 1 wherein the listing information comprises locality information.
3. The method of claim 2 wherein the user computer system is associated with a locality and the locality information identifies the locality associated with the computer system.
4. The method of claim 3 comprising obtaining the locality information by forwarding all or part of a street address at which the user computer system is

located to a geographical coordinate server on the network, receiving the locality information from the geographical coordinate server, saving the locality information at the user computer system, and automatically associating the locality information with listings originating at the user computer system.

5. The method of claim 1 wherein one or more of the listings in the database comprise attachment files stored on the user computer system and the listing information comprises information identifying the attachment files.
6. The method of claim 5 comprising receiving at the programmed user computer system a request for one of the attachment files by way of the network and responding to the request by sending the attachment file on the network.
7. The method of claim 3 comprising conducting a search by:
  - a) receiving a query by way of the user interface, the query comprising a locality criterion;
  - b) forwarding the query to a search server on the network; and,
  - c) receiving from the search server listing information in response to the query.
8. The method of claim 3 comprising conducting a search by:
  - a) composing a query, the query comprising a locality condition;

- b) requesting from one or more distributed search servers on the network, and obtaining, a set of local listing servers on the network which match the locality criterion;
  - c) forwarding the query to the local listing servers in the set;
  - d) receiving search results from at least some of the distributed local listing servers in the set.
9. The method of claim 8 wherein the one or more distributed search servers comprise a search set comprising a set of lowest-level distributed search servers which match the locality criterion and the method comprises obtaining the search set by:
- a) requesting from a higher-level distributed search server on the network a list of lower-level distributed search servers on the network which match the locality criterion;
  - b) receiving a list of one or more lower-level distributed search servers which match the locality criterion from the distributed search server;
  - c) if the lower-level distributed search servers on the list are not lowest-level distributed search servers repeating steps (a) and (b) for each of the lower-level distributed search servers until the search set comprising a list of lowest-level distributed search servers which match the locality criterion is obtained.
10. The method of claim 9 comprising receiving information about the load each of the lower-level distributed search servers is experiencing and eliminating from

the list those one or more of the distributed search servers which are experiencing the highest loads.

11. The method of claim 10 comprising receiving from the distributed search servers information about loads being experienced by each of the local listing servers and eliminating from the set of local listing servers those one or more of the local listing servers which are experiencing the highest loads.
12. The method of claim 8 wherein the one or more distributed search servers comprise a search set, the search set comprising a set of lowest-level distributed search servers which match the locality criterion, the method comprises caching search sets corresponding to one or more locality criteria and, if there exists a cached search set for the locality criterion of the query, forwarding the query to the lowest-level distributed search servers in the cached search set.
13. The method of claim 8 comprising receiving and displaying by way of the user interface search results comprising listing information for one or more listings which match the query.
14. The method of claim 13 comprising, at the user computer system, consolidating the search results by at least removing duplicates from the search results before displaying the search results.
15. The method of claim 13 wherein the listing information comprises information identifying a location of an

attachment to a listing and the method comprises requesting and receiving the attachment by way of the network.

16. The method of claim 15 comprising requesting a copy of the attachment from a search server on the network if the requested attachment is not received before a specified time.
17. The method of claim 13 comprising periodically receiving at the user computer system by way of the network, and storing, a classification data structure and a locality data structure.
18. The method of claim 1 comprising broadcasting listing information about listings in the local listings database to a plurality of other user computer systems on the network.
19. The method of claim 18 comprising maintaining at the user computer system a list of one or more local listing servers covering the user computer system.
20. The method of claim 19 comprising accepting from a user instructions to modify a listing in the local listings database, and sending updated listing information to the at least one local listing servers on the list of local listing servers covering the user computer system.
21. The method of claim 20 comprising determining that one or more of the at least one local listing servers is offline and automatically attempting to resend the

updated listing information to the one offline local listing server after a delay.

22. The method of claim 1 comprising broadcasting a network address for the user computer system to at least one search server to cause the search server to cover the user computer system.
23. The method of claim 1 wherein the listing information comprises an initial price and the method includes receiving from a user information including a price reduction and a time period upon which the price reduction should be effective and automatically modifying the listing after the time period has elapsed to reflect the price reduction.
24. The method of claim 1 wherein the user computer system comprises a distributed local listings server covering one or more neighboring user computer systems and the method comprises receiving by way of the network and storing locally at the user computer system listing information from the one or more neighboring user computer systems.
25. The method of claim 24 wherein the distributed local listings server covers other distributed local listing servers in a geographical coverage area and the method comprises determining if the user computer system has sufficient resources to permit expanding the geographical coverage area to cover additional distributed local listing servers, and, if so, expanding the geographical coverage area.

26. The method of claim 25 comprising obtaining information about the geographical coverage areas of neighbouring distributed local listing servers, determining whether the geographical coverage area of the distributed search server overlaps excessively with geographical coverage areas of the neighbouring distributed local listing servers and, if so, reducing the geographical coverage area of the distributed local listing server.
28. The method of claim 1 comprising running on the user computer system a lowest level distributed search server, the lowest level distributed search server causing the user computer system to maintain a list of network addresses and coverage of one or more local listing servers in a coverage area of the lowest level distributed search server.
29. The method of claim 28 comprising comparing a coverage radius of the lowest level distributed search server to a threshold value and discontinuing operation of the lowest level distributed search server if the coverage radius is less than the threshold.
30. The method of claim 28 comprising obtaining information about the geographical coverage areas of neighbouring lowest level distributed search servers, determining whether the geographical coverage area of the lowest level distributed search server overlaps excessively with geographical coverage areas of the neighbouring lowest level distributed search servers and, if so, reducing the geographical coverage area of the lowest level distributed search server.

31. The method of claim 30 wherein determining whether the geographical coverage area of the lowest level distributed search server overlaps excessively with geographical coverage areas of the neighbouring lowest level distributed search servers comprises identifying a portion of the geographical coverage area that could be eliminated from the geographical coverage area, and determining whether all of the local listing servers in the identified portion of the geographical coverage area are covered by more than a threshold number of other distributed search servers.
32. The method of claim 1 comprising running on the user computer system a higher level distributed search server, the higher level distributed search server causing the user computer system to maintain a list of network addresses and coverage of one or more lower level distributed search servers in a coverage area of the higher level distributed search server.
33. The method of claim 1 wherein the classification data structure comprises a hierarchy of institutions and each listing is classified based on its originating institution.
34. A method for searching for classified listings, the method comprising:
- providing a search query including a locality criterion identifying a geographical area of interest;
  - using the locality criterion to identify a plurality of local listing servers which at least partially cover the geographical area of



interest, each of the local listing servers maintaining a local listings database;

- c) forwarding the search query to the plurality of local listing servers;
- d) receiving search results from the plurality of local listing servers; and,
- e) combining the search results.

35. The method of claim 34 wherein identifying the plurality of local listing servers comprises, communicating the locality information to at least one search server and receiving from the at least one search server information identifying the plurality of local listing servers.

36. The method of claim 35 wherein the information identifying the plurality of search servers comprises network addresses for the plurality of local listing servers.

37. The method of claim 34 comprising initializing a local listing servers by broadcasting a network address for the local listing server to one or more of the search servers.

38. A method for maintaining an index to listings distributed on a plurality of geographically separated computer systems, the method comprising:

- a) initializing a search server associated with an initial coverage area;
- b) obtaining information identifying a set of computer systems containing listings in the coverage area;

- c) generating and sending to the computer systems in the set information identifying the search server;
  - d) receiving at the search server listing information identifying listings held at the computer systems; and,
  - e) indexing the listing information.
39. A computer-implemented method for creating and distributing classified listings, the method comprising:
- a) providing on a computer network a classification data structure providing a plurality of classifications;
  - b) on a network-connected computer system providing local listing server software which, when invoked on a user computer system, causes the user computer system to:
    - download a copy of the classification data structure;
    - provide a user interface providing facilities for creating, maintaining, and deleting listings from a listings database maintained on the user computer system, each of the listings associated with at least one of the classifications; and,
    - upload information about listings from the local listings database to one or more other computer systems on the network; and,
  - c) receiving and storing at one or more listing servers connected to the network listing information, the listing information corresponding to listings in the listings

databases of a plurality of user computer systems, the one or more listing servers each comprising a search engine capable of receiving a query from a user computer system, executing the query and returning a result set comprising listing information corresponding to one or more of the listings.

40. The method of claim 39 wherein there are a plurality of listing servers and the method comprises receiving the search query at a plurality of the listing servers, processing the search query at each of the plurality of listing servers and returning a result set to the requesting user computer system from each of the plurality of search servers.
41. The method of claim 40 comprising, at the requesting user computer system, consolidating the result sets received at the requesting user computer system by at least removing duplicates from the result sets.
42. The method of claim 39 comprising providing on a server on the network a locality data structure comprising a plurality of localities and downloading at least a portion of the locality data structure to one or more user computer systems, wherein the local listing server requires users to associate listings with at least one of the localities of the locality data structure.
43. The method of claim 40 comprising periodically causing one or more of the listing servers to request listing information from local listing servers on one or more

of the user computer systems and periodically receiving and storing uploaded listing information provided by the user computer systems in response to such requests at the one or more listing servers.

44. The method of claim 43 wherein the one or more listing servers each comprise a central search server which maintains coordinate information which identifies a geographic location for each of a plurality of user computer systems,

the method comprising receiving from a requesting user computer system at the central search server a request for listings originating from user computer systems having a specified proximity to the requesting user computer system,

using the coordinate location to identify a set of listings originating from user computer systems having the specified proximity and returning listing information corresponding to the set of listings to the requesting user computer system.

45. The method of claim 44 comprising associating each listing with a grid unit, each grid unit comprising a range of coordinate information, at the central search server, identifying from the specified proximity and the coordinate information for the requesting user computer system one or more grid units for which listings could match the specified proximity and compiling the set of listings from listings associated with the one or more grid units.

46. The method of claim 44 comprising providing a web server associated with one or more of the central

search servers, the method comprising receiving queries by way of the web server, submitting the queries to the central search server, receiving the result sets at the web server, and displaying the result sets of such queries by way of the web server.

47. The method of claim 39 wherein a plurality of user computer systems on the network comprise distributed search server software, the distributed search server software, when run, causing the user computer system to: receive and store in a coverage index the network address and coverage of local listing servers of a plurality of user computer systems; and receive and process queries from other user computer systems.
48. The method of claim 47 wherein the coverage of each local listing server is defined geographically, by classification, by tagword, and/or by keyword.
49. The method of claim 47 wherein the distributed search server software includes instructions which, when run on a user computer system, cause the user computer system to generate and send by way of the network communication messages to the user computer systems listed in the coverage index.
50. The method of claim 49 wherein the local listing server software includes instructions which, when run on a user computer system, cause the user computer system to maintain a reverse coverage set index containing network addresses and coverage of user computer systems from which communication messages have been received.

51. The method of claim 50 wherein the local listing server software includes instructions which, when run on a user computer system, cause the user computer system to periodically send alive messages to the user computer systems in the reverse coverage set index.
52. The method of claim 47 comprising, providing on the network a plurality of distributed search servers organized in a hierarchy of levels, each level of distributed search servers comprising one or more distributed search servers which maintain indices of network addresses and coverage of one or more distributed search servers at a next-lower level.
53. The method of claim 52 comprising, at a requesting user computer system running local search server software, generating a query comprising a locality criterion, forwarding the query on the network to one or more higher-level distributed search servers, and receiving from the one or more higher-level distributed search servers a search set comprising network addresses of one or more next-lower level distributed search servers which satisfy the locality criterion.
54. The method of claim 53 comprising successively repeating forwarding the query on the network to the next-lower level distributed search servers in the search set until a set of lowest level distributed search servers which match the locality criterion is obtained.

55. The method of claim 54 comprising, at a requesting user computer system running local listing server software, forwarding the query to the set of lowest level distributed search servers, and receiving from one or more of the lowest-level distributed search servers in the set a search set comprising one or more user computer systems running local listing servers which satisfy the locality criterion.
56. The method of claim 55 comprising, at the requesting user computer system, forwarding the query to the local listings servers in the search set, and receiving from one or more of the local listings servers in the search set listings that satisfy the query.
57. The method of claim 54 comprising, at the requesting user computer system, removing any duplicates from each search set before forwarding the query to the network addresses in the search set.
58. The method of claim 39 comprising, at a requesting user computer system, receiving listing information from a plurality of the local listing servers at temporally spaced apart times, consolidating the received listing information and displaying at the requesting user computer system one or more listings in the consolidated received listing information and subsequently receiving and displaying additional listing information from at least one of the local listing servers.

59. The method of claim 51 wherein each of the distributed search servers has a coverage set and the method comprises, at one or more of the distributed search servers at each level of the hierarchy, intersecting the search locality criterion with the coverage set to obtain network addresses for one or more next-level down distributed search servers.
60. The method of claim 39 wherein the local listing server software comprises network addresses for one or more highest-level distributed search servers.
61. The method of claim 39 comprising invoking the local listing server on a plurality of user computer systems, maintaining a reverse coverage set at each of the local listing servers and, at each of the local listings servers, periodically sending listings from the local listings database to the local listings servers in the reverse coverage set.
62. The method of claim 61 comprising, maintaining a coverage set for each of the local listing servers, at each local listings server, receiving listings from other local listing servers in the corresponding coverage set, and, adding the received listings to the local listings database of the local listing server.
63. The method of claim 51 wherein the local listing server software comprises computer instructions which, when executed on a user computer system, cause the user computer system to invoke a distributed search server.



64. The method of claim 63 wherein the local listing server periodically determines whether or not to invoke the distributed search server at least in part on the basis of a random factor.
65. The method of claim 63 wherein the local listing server periodically determines whether or not to commence running the distributed search server at least in part on the basis of a current capacity of the user computer system.
66. The method of claim 63 wherein the local listing server periodically determines whether or not to commence running the distributed search server on the basis of a random factor and a probability based upon a current capacity of the user computer system.
67. The method of claim 63 comprising invoking the distributed search server on a user computer system and, upon invoking the distributed search server, executing at the user computer system computer instructions which cause the user computer system to create a database of other user computer systems that meet a locality criterion relative to a locality of the user computer system.
68. The method of claim 67 comprising invoking the distributed search server on a user computer system and, upon invoking the distributed search server, at the user computer system executing computer instructions which cause the user computer system to create a database of other user computer systems that

contain listings associated with a specified classification, locality, keyword, or tagword.

69. The method of claim 39 wherein the local listing server causes the user computer system to periodically upload the listing information from the local listings database to one or more search servers and the method comprises periodically receiving and storing the uploaded listing information at the one or more search servers.
70. The method of claim 69 wherein the one or more search servers comprise a plurality of central search servers and each of the central search servers contain an aggregation of listing information relating to listings in a defined geographical area.
71. The method of claim 69 wherein the one or more search servers comprise a plurality of central search servers and each of the central search servers contain an aggregation of listing information relating to listings in a defined set of one or more classifications.
72. The method of claim 39 comprising receiving at a server a request for:
- the classification data structure, the locality data structure, a portion of the classification data structure, or a portion of the locality data structure from a local listing server running on a user computer system and,
- delivering a copy of the requested classification data structure, the locality data structure, portion

of the category data structure or portion of the locality data structure to the local listing server by way of the network.

73. The method of claim 39, wherein the listing information comprises version information and the method comprises receiving listing information at a listing server, comparing the received listing information to corresponding listing information previously stored at the listing server and, if the version information indicates that the received listing information is a more recent version than the stored listing information, replacing the stored listing information with the received listing information.
74. The method of claim 39 wherein the local listing software comprises instructions which cause a user computer system to receive from a user a query comprising a locality condition or a classification condition, to select a search server on the basis of the locality condition, the classification condition, or both the locality condition and the classification condition and to direct the query to the selected search server.
75. The method of claim 39 comprising, at a search server, identifying frequencies with which words occur in the listing information stored at the search server, compiling a list of highest frequency words, eliminating common words, and forwarding the resulting set of words to one of the local listing servers for selection as tagwords by a user.

76. The method of claim 39 comprising receiving at a search server ratings of listings submitted by users, automatically rejecting any rating submitted by a user for a listing submitted by the same user, and compiling submitted ratings to provide rating information associated with listings.
77. The method of claim 76 comprising, at the search server, receiving a request for listings, locating a set of listings which match the request and excluding from the set listings for which the rating information is unfavorable.
78. The method of claim 76 wherein the local listing server software comprises computer instructions which, when executed by a user computer system, suppress the display of or reduce the display priority of listings for which the relevance rating information indicates that the listing is of low relevance.
79. The method of claim 39 wherein the listing information comprises contact information for establishing peer-to-peer communication with an originator of the listing.
80. The method of claim 79 wherein the local listing server software comprises computer instructions which cause a user computer system to: initiate peer-to-peer communication based on contact information in a listing, and maintain a log of all such peer-to-peer communications.

81. The method of claim 80 wherein the contact information comprises an email address or an instant messaging application name and User ID.
82. The method of claim 39, wherein the local listing server software comprises instructions that, when executed on a user computer system cause the user computer system to determine whether another user computer system from which a listing originated is online and, if so, to display a visual indicator along with a display representing the listing.
83. The method of claim 47 comprising invoking a plurality of distributed search servers by running the distributed search server software on a plurality of user computer systems wherein each of the distributed search servers covers a geographical coverage area and the method comprises determining if a computer system on which the distributed search server is running has sufficient resources to permit expanding the geographical coverage area, and, if so, expanding the geographical coverage area.
84. The method of claim 83 comprising, at one or more of the distributed search servers, obtaining information about the geographical coverage areas of neighbouring distributed search servers, determining whether the geographical coverage area of the distributed search server overlaps excessively with geographical coverage areas of the neighbouring distributed search servers and, if so, reducing the geographical coverage area of the distributed search server.

85. The method of claim 84 comprising comparing a coverage radius of one of the distributed search servers to a threshold value and discontinuing operation of the distributed search server if the coverage radius is less than the threshold.
86. The method of claim 84 wherein determining whether the geographical coverage area of the distributed search server overlaps excessively with geographical coverage areas of the neighbouring distributed search servers comprises identifying a portion of the geographical coverage area that could be eliminated from the geographical coverage area, and determining whether all of the local listing servers in the identified portion of the geographical coverage area are covered by more than a threshold number of other distributed search servers.
87. The method of claim 83 comprising invoking a higher-level distributed search server process at a randomly selected time.
88. The method of claim 39 wherein the local listing server user interface permits the entry of queries by keyword, tagword, classification, and/or locality.
89. The method of claim 39 comprising receiving from a local listing server a new sub-classification for classifying listings and adding the new sub-classification to the classification data structure.

90. The method of claim 89 comprising associating a set of rules with one or more user-created sub-classifications.
91. The method of claim 39 providing, at the search server, associating a set of one or more criteria with an on-line listing service and automatically posting the listing information for listings which satisfy the set of one or more criteria to the on-line listing service.
92. The method of claim 91 wherein the on-line listing service comprises a Usenet group.
93. The method of claim 39 wherein the listing information comprises rich text or HTML information comprising hyperlinks.
94. The method of claim 39 comprising maintaining at the search server a list of criteria of interest to a user, checking listings at the search server to determine whether they match the criteria and, alerting the user by way of the network that a listing which matches such criteria has been detected.
95. The method of claim 39 wherein the user interface comprises a display of a list of classifications from the classification data structure and the method comprises suppressing the display of classifications in which there are no listings.
96. The method of claim 95 comprising maintaining at the search server a count of a number of listings associated with each classification in a

classification data structure, and forwarding the count to one or more user computer systems together with the classification data structure.

97. The method of claim 39 wherein the user interface comprises a display of a list of localities from a localities data structure and the method comprises suppressing the display of localities in which there are no listings.
98. The method of claim 95 comprising maintaining at the search server a count of a number of listings associated with each locality in a locality data structure, and forwarding the count to one or more user computer systems together with the locality data structure.
99. The method of claim 39 wherein the listing information for one or more listings comprises information for retrieving from a user computer system an attachment to a listing corresponding to the listing information.
100. The method of claim 39, wherein the user interface comprises a visual status indicator corresponding to listing information received in response to a query, the listing information comprises status information which indicates whether or not the listing is sold and, the local listing server software comprises computer instructions which, if the status information indicates that the listing is sold, cause the visual status indicator for the listing to change appearance to indicate that the listing is sold.



101. The method of claim 100, wherein the user interface comprises an acceptance control which, when operated by a user, generates and sends to an originator of a listing a message signifying agreement with terms in a currently selected listing.
102. The method of claim 101, comprising automatically providing a form to a person who agrees to pay money to another user by operating the acceptance control, the form comprising one or more fields for receiving credit information identifying an account and a confirmation control which, when operated by a user, indicates an assent to having charges made to the account.
103. The method of claim 39 comprising, at the search server, receiving a query including a classification and forwarding a list of localities for which the stored listing information identifies listings associated with both the received classification and the locality.
104. The method of claim 103 wherein the search server determines a number of listings in the received classification in each of the localities in the list.
105. The method of claim 39 comprising, at the search server, receiving a query including a locality and forwarding a list of classifications for which the stored listing information identifies listings associated with both the received locality and the classification.

106. The method of claim 105 wherein the search server determines a number of listings in the received locality in each of the classifications in the list.
107. The method of claim 39 wherein one or more of the search servers holds information associating users with one or more communities; the listing information includes community information specifying a community to which the corresponding listing relates; and the search server excludes from the result set listing information which specifies a community to which the requesting user does not belong.
108. The method of claim 39, wherein the user interface comprises a template associated with each of one or more classifications of the classification data structure or one or more localities of the locality data structure, the template defines specific information for inclusion in a listing and the user interface applies the template in response to a user selecting a classification or locality corresponding to the template.
109. The method of claim 39 wherein the search server comprises a database comprising business advertisements each associated with the classifications, in response to receiving from a user computer a query including a classification, the search server locates a business advertisement which matches the query classification, and forwards the business advertisement to the user computer system for display.

110. The method of claim 39 wherein the search server continues to store expired listings and responds to queries for expired listings with a set of expired listings that match the query criteria.
111. The method of claim 47 comprising, providing on the network a distributed search server running on a user computer, the distributed search server maintaining a coverage index including network addresses for one or more user computer systems covered by the distributed search server,  
periodically receiving at the distributed search server alive notices by way of the network from user computer systems, and,  
upon receipt of an alive notice from a user computer system not in the coverage index, adding the user computer system to the coverage index.
112. The method of claim 111 comprising removing a user computer system from the coverage index if an alive notice is not received from that user computer system within a time period.
113. Apparatus for publishing classified listings, the apparatus comprising:
- a) a processor
  - b) a user interface;
  - c) a locally stored classification data structure defining a plurality of classifications;
  - d) a database for storing listings;
  - e) stored geographical location information; and,
  - f) software which, when executed on the processor, causes the processor to receive listing

information defining a listing from the user interface, the listing information including a selection of one of the classifications, and to store the listing information in the database together with the stored geographical location information.

114. A program product comprising a computer readable medium carrying signals corresponding to computer instructions which, when executed by a computer, cause the computer to perform a method according to claim 1.
115. A method for obtaining a file in a peer-to-peer file transfer system, the method comprising:
- a) requesting a file in a peer-to-peer manner;
  - b) waiting for a period;
  - c) if the file has not been received then requesting a copy of the file from a central server.